

AMENDED CLAIMS

[Received by the International Bureau on 26 May 2005 (26.05.05)
original claims 1-8 amended;
claims 9-16 cancelled (2 pages)].

1. A method for use in a receiver, the method comprising:

processing a received signal with a phase-locked loop (PLL);

5 generating a carrier frequency offset estimate as a function of a phase error signal of the PLL; and

detecting a false lock condition as a function of comparing the carrier frequency offset estimate to a closed loop value of the PLL.

10 2. The method of claim 1, wherein the processing step includes the step of setting the PLL in an open loop mode of operation.

3. The method of claim 1, wherein the generating step includes the steps of:

determining a rollover count value for the phase error signal;

15 determining a symbol count value of the received signal; and

generating the carrier frequency offset estimate from the determined rollover count value and determined symbol count value.

20 4. The method of claim 1, further comprising the step of updating the PLL with the carrier frequency offset estimate.

5. A receiver comprising:

a carrier tracking loop (CTL) for processing a received signal; and

25 a processor for estimating a carrier frequency offset as a function of a phase error signal of the CTL;

wherein the processor detects a false lock condition as a function of comparing the estimate of the carrier frequency offset to a closed loop value of the CTL.

30 6. The receiver of claim 5, wherein the CTL includes a rollover counter and a symbol counter accessible by the processor for use in estimating the carrier frequency offset.

7. The apparatus of claim 5, wherein the receiver is a set-top box.

8. Apparatus comprising:

a complex multiplier for multiplying a receive signal having a carrier frequency with a recovered carrier for providing a derotated signal;

a phase error detector responsive to the derotated signal for providing a phase error

5 signal representative of phase errors between the derorated signal and target symbols selected from a predefined symbol constellation;

a loop filter for filtering the phase error signal to provide a filtered signal;

an integrator for integrating the filtered signal to provide an integrated signal;

a sin/cos table responsive to the integrated signal for providing the recovered carrier;

10 a processor for updating the integrator with a carrier frequency offset estimate as a function of the phase error signal;

a rollover counter for counting a number of rollovers of the phase error signal; and

a symbol counter for counting a number of symbols in the derotated signal;

15 wherein the carrier frequency offset estimate is generated from the counted number of rollovers and the counted number of symbols.